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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

PLAN OF OPERATION FOR CONTROL OF THE MOUNTAIN PINE BEETLE IN LODGEPOLE PINE BY BURNING STANDING TREES

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PLAN OF OPERATION FOR CONTROL OF THE MOUNTAIN

PINE BEETLE IN LODGEPOLE PINE BY BURNING STANDING TREES

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PLAN OF OPERATION FOR CONTROL OF THE MOUNTAIN PINE BEETLE IN LODGEPOLE PINE BY BURNING STANDING TREES

INTRODUCTION

This plan of operation has been prepared in the hope that it will be of some assistance to forest officers who are in charge of barkbeetle control projects within the lodgepole pine stands of District 4. It is essential that all insect control projects be instituted on some definite plan of organization. This plan is therefore submitted in the hope that it will be adopted either in its entirety or in part, or discarded and used as a basis upon which to develop a better one. The desire of the writer to emphasize the need for some such plan has prompted his action in this matter. For the most part the different phases of this plan are not untried innovations as most of them have been instituted on other projects and proved fairly successful.

The need for some portions of this plan may be questioned as being superfluous or too detailed to meet the requirements of such projects. In explanation as to their need it can be said that it is only from such detailed data that a careful analysis can be made of costs, and a just comparison established between different crews, camps, and projects. Furthermore, practically all of the records,

etc. which are called for in this plan, will be found to be essential in the proper and efficient administration of the project. In the institution of barkbeetle control work, which is becoming more widespread each year, there are two distinct phases of the problem that are more or less closely related. These two phases are the development of more efficient and economical methods of control, and the improvement of administrative technic in handling control projects, which will tend to greatly reduce the cost of institution. To meet the first obligation the Bureau of Entomology is directing practically its entire effort towards the development of a more economical and efficient method of control. Members of the Forest Service have also contributed valuable thought and assistance towards this end. In complying with the second requirement it is only by keeping rather detailed cost and production records that a correct analysis can be made of a project and steps taken to eliminate or improve the weak spots in its administration. Many of the items discussed or mentioned in this plan are no doubt unnecessary as they are but the logical lines which anyone would follow in the organization of such a project. However, with the desire to make this plan as complete as possible these points have been included, but with a full realization that most of them are already fully understood by the officers in charge.

SIZE OF CONTROL ORGANIZATION

The size of the most efficient organization for each of the different areas for which control work is planned is

indeed a difficult question to answer, as there will always be many different factors to be considered. Though the burning method of control as now practiced permits the continuation of the work until such time as the insects start to emerge, there still remains a time element which must be considered. Late springs and bad weather conditions, coupled with this time element, give a relatively short working season of approximately 30-40 days. This condition often requires that the work be pushed to a degree that is often beyond the maximum efficiency of an organization. The number of trees to be treated and the intensity of the infestation will have a material bearing on the size of the organization required in order to complete the work in the time allotted. With numerous large groups of infested trees the output per man day will be increased, while with a scattered infestation this production will, of course, be lowered and a larger organization required. The best method to follow in determining the most efficient size of an organization is to start with a rather small number of treating crews and crowd the actual spotting of the area in question as rapidly as possible. With data secured from the spotting crews showing the number of trees to be treated and their location within the area, the necessary strength of the treating organization can be determined and added to that already in the field.

NUMBER OF CAMPS REQUIRED

The determination of the number and location of camp sites is a problem often decided by the question of roads, fuel, and water supply. The most advantageous camp sites are in the center of the most heavily infested areas, which would be difficult to select before a region had been spotted. It is best to push the spotting as rapidly as possible in order to determine the actual number of trees to be treated and their location. From this data one can more efficiently determine the number, and the most desirable location, of the required camps; but, as stated, camp locations are often governed by water, fuel, and transportation. A greater efficiency will be secured from larger and fewer camps because of reduced overhead, cooks, transportation, etc. However, the value of this reduction in nonproductive labor must be weighed against the effects of walking the men long distances or over rough terrain to their work.

The expense of moving a camp from one site to another must be compensated for by a proportionate increase in production in order to make such action justifiable. It is believed it will be more economical to have one large camp which will need to be moved once during the season than to have two small ones for the entire period.

CAMP ORGANIZATION

All control projects should be under a project manager and each camp should be in charge of a camp manager who is directly responsible to the project manager. Whenever possible such managers should be

forest officers for reasons readily understood. The camp manager will be in direct charge of the camp and responsible for the action of all spotting and treating crews working from it. He will have supervision of the camp organization and administration and will be held responsible for the preparation and submission of reports, as well as the character of the work of spotting and treating crews emanating from his camp.

Though the spotting crews work somewhat independently from the treating organization, it should be understood that they are under the supervision and direction of the camp manager. They will take orders from him relative to the areas he desires to have spotted and will be expected to assist the other men in the establishment and moving of camps.

The preparation by the project leader of detailed memoranda of instructions for camp managers, chief spotters, packers, teamsters, etc. will be found to be a good policy to follow. Such memoranda will contain information relative to the duties of these men, their responsibilities, the methods to be followed and reports to be submitted. It will be found that the use of such memoranda will eliminate many misunderstandings.

CAMP EQUIPMENT

In this plan no attempt has been made to outline the necessary equipment which should be available in all camps. This equipment varies for different regions and what would be necessary in one district would be inadequate or superfluous in another. However, there are a few items which the writer feels should be added to the present camp equipment as being essential. It is felt that for each camp there should be a 10x12

tent for the camp manager to serve as his sleeping quarters and as an office tent where he can have a certain amount of privacy in order to keep his time slips and production records up to date. It is also believed that each bunk tent should be provided with a stove rather than to follow the practice of having one community tent so equipped. A stove in each bunk tent will afford greater comfort to the men in wet and cold weather and insure better health conditions. Each camp should be provided with adequate first-aid equipment. This equipment should include a supply of unguentine, or similar substance, for the treatment and prevention of oil burns. Bunk tents, bedding, kitchen equipment, etc. must be sufficient to care for the organization of each camp. The benefits of a comfortable camp will be realized in better health conditions and a corresponding greater production of labor.

Treating Crews

With the method of treating the standing infested trees with fire, very little equipment is required. The first requirement is, of course, the spray tanks, necessary extensions, repair parts, etc. Oil carriers should be provided with 5-gallon carrying cans, funnels, siphon hose, etc., and it is believed that the addition of carrying yokes would be of value. It is further believed that pack-horse tanks can be developed for carrying oil by pack stock. Such tanks are used by the Kootenai National Forest to carry water to fire lookouts, dry trail camps, etc., with good success. Such equipment would permit the oil to follow the burners and would eliminate a great deal of lost time.

Spotting Crew Equipment (5-man crew)

100 Spotter's Daily Reports
12 Spotter's Weekly Reports
1 compass, F.S. Standard, with staff
1 tally register
1 map of forest area, ½" scale or larger
25 map sheets, Form 878
1 aluminum holder, 8½x11"
5 hand axes, with sheaths
10 lbs. tacks
3000 cloth tags, 4x6"
1 doz. pencils and erasers, 4H
2 blue pencils
2 red pencils
2 green pencils
2 yellow pencils
Carbon paper
1 box lumber crayon, soft black
1 canvas carrying case

Camp Manager's Equipment

Time book
Time slips
Stationery
Envelopes
Camp Manager's Weekly Reports
Burner's Daily Report
Crew Foreman's Weekly Reports
Pencils
Horse contracts
Man contracts
Compensation forms
Etc.

SPOTTING

The importance of spotting in its relation to a control project cannot be overemphasized. Spotting is the term applied to the location and marking of beetle-infested trees for treatment. It is not an extremely technical task but is one that requires a certain amount of training and experience if the work is to be efficiently performed. It is

felt that men have been sent into the field and charged with the responsibility of locating infested trees who have not had proper training or instruction in the work. It has been found that men who have keen minds and observing eyes make the best spotters. Men should be selected who are interested in the work under way and who will realize that the first essential step in a barkbeetle control project is the proper location of the infested trees. Furthermore, these men should not be released to the task of spotting until they have had sufficient training or instruction to give them confidence in their work. If proper and careful instruction is given to these men they will be impressed with the importance of their work and better spotting will follow. If a project is to be charged with the expense of an adequate survey it is important that the work be thoroughly and efficiently performed. Spotters must be men of sufficient judgment and intelligence to absorb the instructions given to them so that they can properly locate and determine which trees should be marked for treatment. Spotting is often very hard work and men are required for this task who are capable of walking long distances every day.

Though various methods of spotting have been tried, the only plan that has given complete satisfaction, while expensive, is the 100 per cent survey. These surveys are conducted by a compassman, or chief spotter, and an even number of spotters. In most lodgepole pine stands a 5-man spotting crew can be effectively used. A 100

per cent survey is secured by a spotting crew stripping an area on a paced compass line. The compassman, or chief of party, is held responsible for the compass work, pacing, construction of a map showing the number and location of infested trees, and the proper marking of infested trees for treatment. Each spotter is held responsible for the location and marking of all infested trees within a strip, which will vary in width for different regions, on one side of and parallel to the course of the compassman. The importance of the map prepared by the chief spotter cannot be overestimated. When spotters' maps are accurately prepared the treating crew foreman will have no difficulty in relocating the trees marked for treatment which will materially increase the daily output of the treating crews. Only necessary data should be shown and the little details that are of no real value but only help to complicate reading the map should be omitted. It will be necessary for the chief spotter to prepare copies of these maps for the camp manager and for each treating crew working in the area, as well as one for the office files of the Forest if it is so desired. With the exception of the original, these additional maps may be carbon copies which make very little extra work.

There are various methods of marking infested trees for treatment varying from a mere blaze to the use of a paper or cloth tag. The use of a white tag made from sign painter's cloth has given very good satisfaction in the past and as these tags can be secured very cheaply it is recommended that they be used. However, it is possible that a more satisfactory material can be developed. The advantage of

these white cloth tags is that they can be seen very easily for a rather long distance. Each infested tree is marked with one of these tags on which is written, with lumberman's crayon, the crew symbol and the tree number, with the initials of the spotter in the lower right-hand corner. Each spotter will carry his own supply of tags which, with the exception of the tree number, will have been previously prepared with the required lettering. When an infested tree is located the spotter stops the compassman by calling "bugs" and then calls to the chief spotter for a number. This number is placed on the tag which in turn is fastened to the tree with a tack in each upper corner. On the side of the tree opposite the tag the tree should also be blazed and the number placed thereon. This will take but a moment and can easily be done while the compassman is marking the tree location on his map. This additional marking will be found to be of value in relocating the tree, as a small per cent of the tags are sometimes destroyed by deer and squirrels, and it also places a mark on both sides of the tree. When marking a group of trees the tags should be faced to the outside so that the group can be seen from all angles. By securing the tree numbers from the compassman, or chief spotter, consecutive numbers are thus used and a great deal of confusion is avoided.

The width of the strip each spotter can cover will depend upon the character of the terrain and the timber type being surveyed. As there is seldom any discoloration of the foliage of beetle-infested lodgepole pine during the month of May, and pitch tubes are often very

hard to see, the strip can be only of such width as to permit each spotter to view rather closely the trees within his assigned area and not retard the progress of the compassman. A 1½-chain strip will be found to be the maximum width that one man can efficiently cover in lodgepole pine, and it is believed that even better results will be secured from a 1-chain strip.

Though, as stated, it has been rather generally demonstrated that the 100 per cent survey for insect control projects is the most satisfactory, there are conditions that would justify a deviation from this policy. Such deviations must be tempered by the good judgment of the camp manager and chief spotter. With large blocks of solid infestation it would be unwise to attempt the gridironing of such an area and the marking of the many infested trees with a spotting crew. It would be found more economical to place one spotter in such areas with the treating crews with the idea of having him keep ahead of the burners. If a 100 per cent clean-up of such areas is desired it will be necessary to subsequently re-survey such regions with a spotting crew in order to locate the trees missed by the one spotter. This policy can often be adopted and followed to very good advantage, and it is believed that it was so used on an area or two within the Targhee Forest last season. In addition to the map he is obliged to prepare the chief spotter will also keep the Spotter's Daily Report and the Spotter's Weekly Report.

DETERMINATION OF TREES TO BE MARKED

In considering the importance of careful spotting, it will be found that there are two distinct phases of the work. These are: (1) the location of all infested or attacked trees within an area; and (2) the proper marking of them after they have been located. The location of attacked trees is but a mechanical operation which, if one is alert, can be made nearly 100 per cent effective. The problem of determining if a tree that shows the external signs of a barkbeetle attack should be marked often offers more serious difficulties.

The insect we are combating is known as the mountain pine beetle (Dendroctonus monticolae), which attacks and kills healthy mature western white pine, western yellow pine, lodgepole pine, sugar pine, white-bark pine, and sometimes Engelmann spruce when in close association with infested pine. The adult insects are rather stout, black, cylindrical barkbeetles, varying in length from three and a half to six and a half twenty-fifths of an inch. These beetles bore through the outer bark and construct long perpendicular egg galleries directly beneath the bark, which slightly groove the wood and extend up the tree. At the bottom or start of these galleries, which vary in length from 12 to 30 inches, there is normally a slight crook of an inch or more that starts at the entrance hole. Eggs are deposited along this gallery which soon hatch into small, white grubs or larvae. In feeding, these larvae excavate individual larval mines at right angles to the egg gallery, which vary in length and width, and are exposed on the surface of the inner bark. When mature the larvae

construct a small cell at the end of the larval mine in which the transformation to the new adult takes place. During this transformation the insect goes through what is called the pupal stage, and the small cell is termed a pupal cell.

When the transformation is complete the new adults bore away the intervening bark between cells and congregate beneath the bark for some time before emergence, or they may bore emergence holes directly out from the pupal cells. When emerging after congregating several insects may use the same emergence hole, or quite often advantage is taken of cracks in the bark, woodpecker work, etc. The emergence of this insect occurs during July and August, and the new attacks are made during this period. The winter is passed by the insect in an immature larval stage.

Insect-attacked trees are located by the presence of small pitch tubes at the mouth of the entrance hole, discolored foliage, woodpecker work, or boring dust at the base of the tree. Pitch tubes are not always present, as when the attack is extremely heavy there are very few, if any, to be seen, so one cannot depend upon this rule as an infallible guide. A few large pitch tubes are usually, but not always, an indication of a pitched-out attack. Woodpecker work is a true indication that there were and probably still are insects beneath the bark. However, it does not prove that the insect is the mountain pine beetle.

Faded foliage can be used as a guide to infested trees, but as the degree of fading will vary for different trees, it must always

be supplemented by an examination of the tree. There is no infallible rule which can be given for the proper marking of trees from external evidence. It will be necessary to examine nearly every tree by removing a piece of bark. If the tree has been killed by the mountain pine beetle and there are undeveloped insects beneath the bark, it should be marked for treatment. By undeveloped insects is meant the larvae, pupae, and new adults of the developing broods of the mountain pine beetle. The overwintering parent adults will be found in the top of egg galleries. Normally they will be dead, but do not mark trees for treatment on the strength of these old adults, for even if they are alive they are of very little, if any, importance. The new adults will vary in color, appearing first as pure white to brown and then to black prior to emergence. Many trees may perhaps be found which are attacked on one side only. Where insect broods are present the trees should be marked for treatment.

The safest method to follow in separating the work of the mountain pine beetle from associated insects which may be found attacking weakened trees, tops of infested trees, etc., is the character of the gallery pattern. The work of the mountain pine beetle is very distinctive and can easily be separated from all other barkbeetles. All Dendroctonus egg galleries are packed solid with boring dust, while those of Ips and other species are open and free from boring dust.

METHODS OF CONTROL

The method of control being used at this time in District 4 is to spray the trunks of standing trees with a fuel oil and burn them while

standing. This method is very efficient and destroys all insects beneath the bark on that portion of the bole which is sufficiently charred. When it is possible to crown the fire out through the top of the trees all insects are destroyed. There is no intention to enter into a discussion as to the need for the development of a better piece of equipment than that used last season. It is believed that if the oil can be thrown from 4-6 feet higher it will be possible to crown a very large per cent of the trees treated. This need is realized by all parties concerned and every effort is being made to develop some such equipment. It is necessary to rather thoroughly char or blacken the bark in order to secure a temperature of sufficient intensity to destroy the insects beneath it. With large trees where the bark is thick at the base it is necessary to use more oil and char the bark more thoroughly.

The height to which the attacks extend up the trees varies considerably and there seems to be no definite rule which can be applied. When trees are felled for treatment they should be treated up to a point where the sapwood is no longer blue. This is a rather definite rule and can be followed when such methods of treatment are used. However, when standing trees are treated it is impossible to determine the height of infestation, so it is necessary to consider all trees as being infested up to at least a 5-inch top.

The organization of the treating crew is indeed a very difficult problem and one upon which the writer feels hardly qualified to more than suggest a solution. It seems very evident that it is necessary to

have adequate supervision over the burners rather than to send them out to locate and burn marked trees by themselves. Such administration is necessary to more properly direct the activity of the burners and the degree to which certain trees should be treated, to relocate new groups of marked trees for treatment, and to give general supervision as to the location of the oil drums in the field, character of work, etc. It would seem that the treating crews should be organized with a crew foreman and as many burners and oil carriers as he can effectively supervise and keep occupied. The number of men that one foreman will be able to supervise will be largely determined by the character of the infestation being treated. Men should be selected for burners who are capable of exercising a certain amount of judgment relative to the treatment of the infested trees. Some trees only need to have the lower 8 or 10 feet of the bole treated, while it is necessary that others be crowned by fire if all of the insects are to be destroyed. Tall trees can often be crowned by placing poles against the trunk and piling brush and chunks against the base in order to secure a greater volume of heat. It will often be necessary for the burners to decide such cases by themselves as it is impossible to have a foreman inspect each tree before it is treated. It would therefore seem necessary to place a certain amount of responsibility upon each of the burners. This responsibility should perhaps be compensated for with a slightly larger wage. It will be necessary for each burner to collect the tags from the trees he treats. The tree numbers from these tags he should record numerically, with any remarks he would

care to make, on the Burner's Daily Report. Though this does require a certain amount of evening labor it has been found that if the men are provided with warm and comfortable tents most of them react favorably to the responsibility of having a semi-formal report to prepare. This report with the tags should be submitted to the crew foreman.

FORMS AND RECORDS

There is a natural tendency on the part of many people to shy away from forms. Forms seem to spell clerical labor. Last season on the Targhee National Forest practically every feature of this report was put into operation after the project was well under way. The institution of these various features was seriously handicapped by lack of forms which would have made the work much simpler and far more efficient. These forms have been developed with the idea of assisting the men charged with the responsibility of recording certain data which are thought to be essential in the prosecution of the project. Most of these forms have been used before and found to be satisfactory. They simply provide an easy method of recording data. The value of such reports, however, lies in their being kept up-to-date and in their prompt submission. A discussion of the use and preparation of the various forms follows.

Marking Tags

The sample of tag to be used in marking trees for treatment is shown on Page A. This tag is made from sign painter's cloth and should be approximately 4x6 inches in size. The tags will be prepared by the

spotters so as to show the symbol of the spotting crew, i.e. "A", "B", "C", etc.; tree number (195), and the initials of the spotter in the lower righthand corner. The crew symbol and the spotter's initials are placed on the tags by the spotters before going into the field. The lettering should be an inch or more below the top of the tag so that when it is torn from the tree the data will not be destroyed. At the time the tree is treated the tag is removed by the burner. These tags are preserved and used by the burner in preparing the Burner's Daily Report.

Maps

Standard map sheets (Form 878) are used in the preparation of the spotters' maps. They should be carefully and accurately prepared. It is from these maps that the marked trees are relocated for treatment. An error in the construction of these maps may result in a treating crew marking time for several hours or cause the treating crew foreman unnecessary time and labor in relocating the trees marked. Extra care and thoroughness may save hours of nonproductive labor. If the region has been surveyed and spotting is being conducted from section lines then only one section or part thereof should be shown on each sheet. Only essential data that will prove of real benefit in helping to relocate the trees should be placed on the map. Trails, streams, ridges, peaks, fences, cabins, telephone lines, etc., are some of the features that should be shown, while the little details of no value should be omitted. The number of maps required will vary for each area, and a decision from the project manager will often be necessary. A sample map is shown on Page B.

Spotter's Daily Report

This form, as shown on Page C, is used by the chief of spotters for the purpose of keeping a record of the tree numbers used during the course of the day by his spotting crew. These numbers, which are kept consecutively by each crew, are placed on the form before going into the field. As a number is given to a spotter it is checked off in the column marked "S", which means spotted. At the close of each day this form is turned in to the camp manager who checks off in the column marked "T", all tree numbers turned in by the crew foreman as treated. It is in this way that the camp manager can determine if any marked trees have been missed by the treating crews. The following day the chief spotter starts his sheet with the next number following the last one given out on the previous day.

Spotter's Weekly Report

This form is prepared by the chief of each spotting crew for the purpose of reporting the results accomplished during the past week, as well as all general information relative to the amount of territory remaining to be covered from the present camp and the amount of time he estimates will be required. Suggestions as to the proper location of control camps so that they will be centrally located to the trees marked are required. In order to keep an accurate record of spotting output it is necessary to show in the column marked "Man Days" the number of effective man days for each day worked. This report is prepared in duplicate as copies are required for both the project and camp managers. A sample of this form is shown on Page D.

Burner's Daily Report

This form is used by the burners for the tabulation, in numerical order, of the tree numbers of the trees treated each day. This information he will secure from the tags he removes from the trees before burning. This report will be submitted each evening to the crew foreman to be used in preparing the Crew Foreman's Daily Report. A sample of this form is shown on Page E.

Crew Foreman's Daily Report

This form will be used by the crew foreman in tabulating the data submitted to him from each of his burners. Under the column captioned "Burner" he will list the man's name with the number of trees he has treated, together with any remarks he may care to make relative to the work of that particular burner. At the bottom of this report the crew foreman will list the total number of trees treated by his crew together with the total crew man days. Then by dividing the total number of trees treated by the total crew man days he will secure the total trees treated per man day. This form together with the Burner's Daily Report will be submitted each night to the camp manager. The camp manager will then check the burners' reports against the spotter's daily report in order to ascertain if all trees spotted have been treated. A sample of the Crew Foreman's Daily Report is shown on Page F.

Camp Manager's Weekly Report

This form is used by the camp manager in submitting a weekly report to the project manager covering the activities of his camp.

On this form he will show the daily record of the different treating crews. In the space captioned "Trees Treated" he will insert the crew foreman's name and give for each day the total number of trees treated. He will also show in the proper space the number of meals served; number of effective man days treating; number of effective man days spotting; number of all other man days in camp; total number of man days paid; and total number of man days contributed. The total man days paid with the total man days contributed should equal the effective and noneffective labor for each week. Information relative to personnel, equipment, etc., should be shown under "Remarks". A sample of this form is shown on Page 6.

Camp Production Record

Though not at all essential it is sometimes of interest for the camp manager to keep a chronological record of the daily output of his camp, and trees per effective man days, or any other information which the camp manager might desire to include to show the production or progress of the work in his camp.

Truck and Horse Reports

Standard forms which are in use by the respective Forests should be used in keeping a record of transportation charges. It has been found that transportation often proves to be one of the items of cost which is entirely out of proportion with the other expenditures of the project. From an analysis of accurate truck and pack stock records, it will often be found that such excessive charges can be eliminated in the future by more careful ordering of supplies, transportation of men, etc.

Cost Keeping

In order that an analysis can be made of the cost of the various activities which go to make up a control project, it is necessary that a more detailed accounting be maintained than that which is usually practiced for more firmly established forest projects. Such an analysis is believed to be essential in order that improvements in technic of application and administration can be effected. It is desired, however, that this cost keeping be reconciled to the system practiced by the Forest Service. Detailed costs are required for the following:

Spotting	Equipment and Supplies
Treating	Transportation
Overhead	Subsistence
Camps	Other or Miscellaneous

Any method of accounting which will show these itemized costs will be satisfactory.

Time Reports

The standard time report (Form D.1-40) will be used in keeping the time of all men employed on the project. On this form the different activities on which a man is engaged will be listed under "Projects or Activities" and the time he spends charged against them. The total time, rate, and amount earned are extended and totaled as the sample form on Page H. Commissary and charges for board are deducted from the total amount earned and shown as Net Due.

LIST OF FORMS AND BY WHOM SUBMITTED

Forms	Submitted	Sample Page
Marking Tags	Chief Spotter	A
Spotter's Maps	Chief Spotter	B
Spotter's Daily Report	Chief Spotter	C
Spotter's Weekly Report	Chief Spotter	D
Burner's Daily Report	Burners	E
Crew Foreman's Daily Report	Treating Crew Foreman	F
Camp Manager's Weekly Report	Camp Manager	G
Truck and Horse Reports	Operator	—
Time Reports	Camp Manager	H

CONCLUSIONS

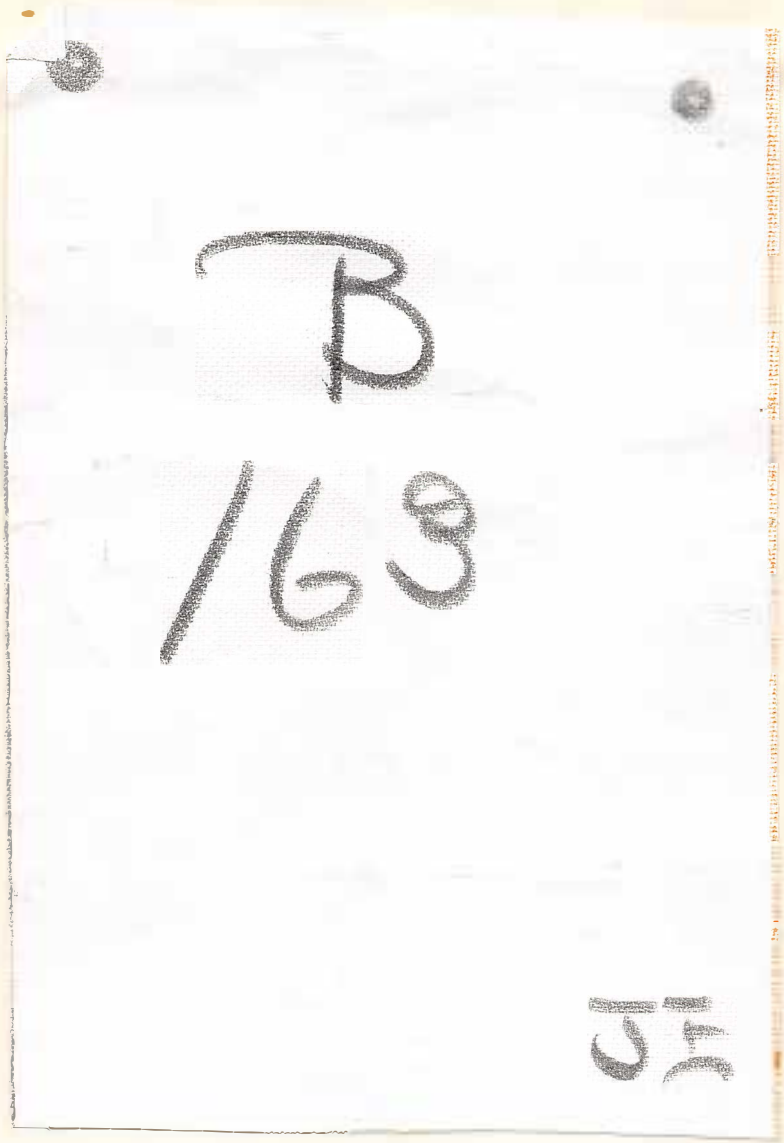
The first reaction one may secure from reading this plan is that there are a lot of forms and that some unnecessary data have been called for which will add materially to the cost of the project. This, however, is not the case. All the data which have been called for will be found of value in the proper administration of the project. Relative to the time required for the preparation of the reports it has been found that the men who are responsible for their submission prepare them after hours at no cost to the project and seem to enjoy this bit of responsibility. The method as given for the keeping of project costs will no doubt entail additional labor on the part of the clerk responsible for vouchering bills, etc. However, it is believed this additional effort will be more than compensated for in the value of the information secured. Such data are essential if one attempts to make a detailed analysis of the cost of a project.

Respectfully Submitted

James J. Brandon

Entomologist.

December 2, 1929


B
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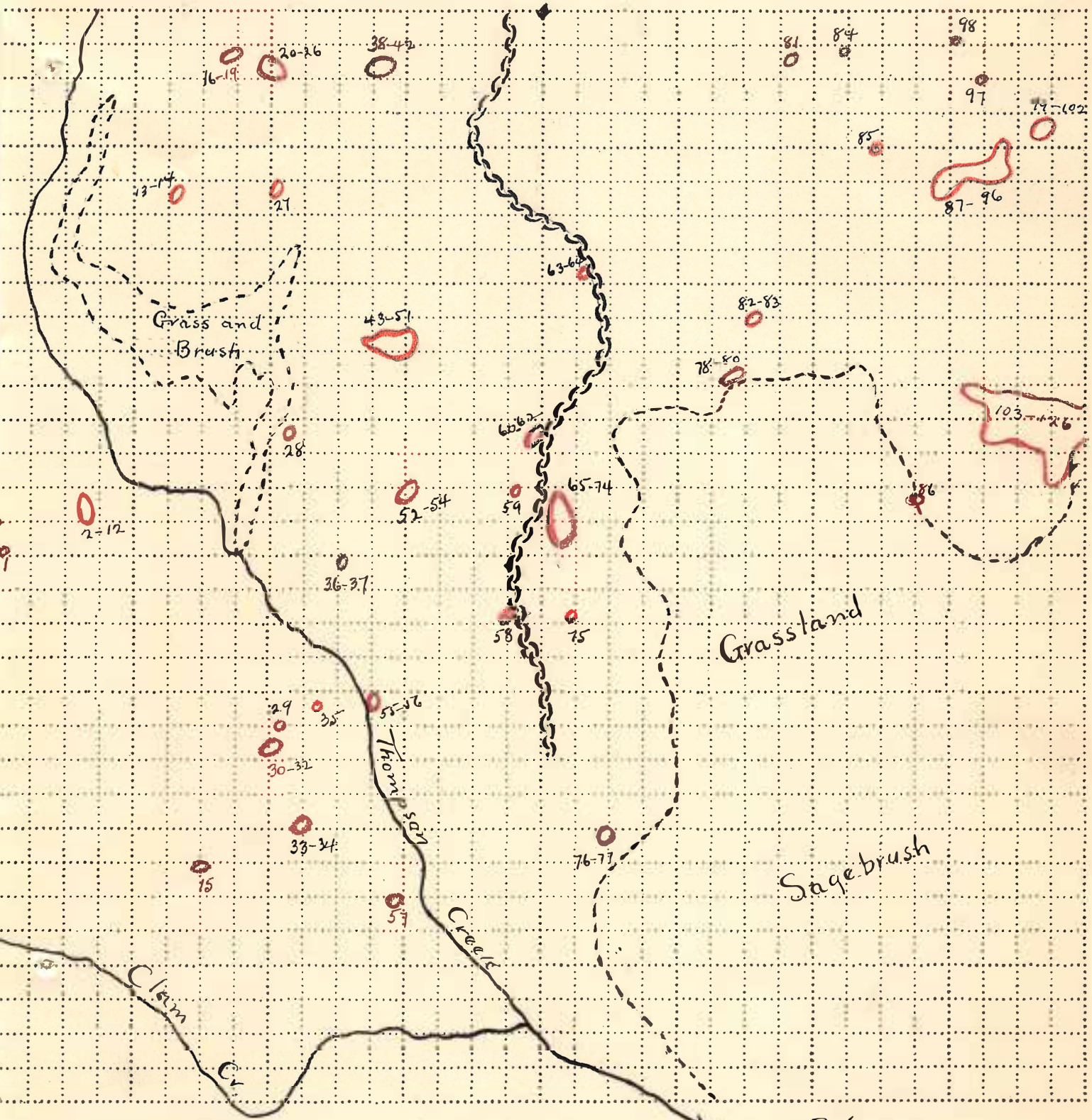
UNITED STATES DEPARTMENT OF AGRICULTURE—FOREST SERVICE

_____ Land District. Mag. Declin. _____ Area _____ Acres

_____, Sec. 30 T. 1 N. R. 15 W. Mer. Scale 8 inches = 1 mile
(Case designation.) (Subdivision and section.)



Field work by _____, Date June 12, 1928, Platted by Peterson

Remarks: No of Trees 126

_____ Approved _____, 19____, _____
(Approving officer.)

Form 878
(Revised April, 1916)

B

S—433

I. C. Form "E"

SPOTTERS DAILY RECORD

Project area Unit Camp No.

Date Spotter T. R. Sec.

S	Tree No.	T	S	Tree No.	T	S	Tree No.	T	S	Tree No.	T

C

SPOTTER'S WEEKLY REPORT

Week of_____to_____ Crew Symbol _____

Camp _____ Unit or Forest _____

Record of Trees Marked for Treatment

Date	Number of Trees Spotted	Section or Area Worked	Man Days	Remarks
S				
M				
T				
W				
T				
F				
S				
Total				

Remaining territory to be covered from present camp _____

Number of days required to complete present camp area _____

Suggestions as to location of control camp in present area _____

Suggestions as to new location for spotter's camp _____

Remarks. (Suggestions, Requirements, Etc.)_____

Signed_____

Chief of Spotting Crew

D

BURNER'S DAILY REPORT

Camp _____ Area _____ Forest _____

Date _____ Signature _____

Tree No.	Tree No.	Tree No.	Tree No.	Tree No.

CREW FOREMAN'S DAILY REPORT

Camp _____ Area _____ Forest _____

Date _____ Man Days _____

_____
Signature Crew Foreman.

Burner	Number of Trees Treated	Remarks

Total Trees Treated _____

Total Crew Man Days _____

Total Trees per Man Day _____

Remarks _____

F

CAMP MANAGER'S WEEKLY REPORT

Forest _____ Unit _____ Camp _____

Production Record for Week of _____ to _____

Day	Trees Treated	Crew Man Days	Trees Treated	Crew Man Days	Trees Treated	Crew Man Days
S						
M						
T						
W						
T						
F						
S						
Totals						

Meals Served

Day	Number
S	
M	
T	
W	
T	
F	
S	
Total:	

Total effective man-days treating _____

Total effective man-days spotting _____

All other man-days in camp _____

Total man-days paid _____

Total man-days contributed _____

Remarks: _____

_____

Signed _____

CAMP MANAGER

G

Form D. 1-40

TIME REPORT

Name Smith, John A.
(Print name same as spelled by employee)

Send check to 123 Rose Ave., Spokane, Wash.

Coeur d'Alene Forest

Steamboat Control Project Ranger District

May (Month)

1929 (Year)

Employee transferred from ____ { Crew / District

to ____ { Crew / District on ____, 192

	Date	Remarks
Laid off		
Quit		
Discharged		

PROJECT, or activity if no project involved	Title	Appropriation	DAILY TIME RECORD 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total time	Rate	Amount earned	Deductions	Net due
Spotting							S	S	S	S	S	S					4	S	S	S			S	S	S			S	S				14½	4.00	58 00		
Treating													S	S	S															S	S	S	S	7	4.00	28 00		
Moving Camp	Spotter															S	4																	1½	4.00	6 00		
Flunkey																					S	S												2	4.00	8 00		
Truck Driver																										S	S							2	4.00	8 00		
Totals																																			108 00	33 00	75 00
Off duty without pay																																					

Deduct from pay 8 8 1.15 27 00 75 00

Itemized Charge Account, Commissary: Sox, Shoes

Other (Board, Transportation, etc.): Board 5th to 31st, 27 days @ $1.00

Value | Property | Total

Returned | Received | Date

I certify that I have received the supplies itemized herein and that the commissary, property, and other charges are correct and time as itemized is correct.

(Signature) X (Employee)

I certify this to be a true statement of the charge account and time as shown by my records.

(Signature) X (Timekeeper)

Approved X (Forest officer)

INSTRUCTIONS

Indicate time, in hours, for which pay is to he received each day in spaces provided for daily entries. Do not overlook 31st day. Enter Leave Without Pay in last line of daily record.

If employee is transferred from your job or district, complete his time report to the time he finishes work for you, cross rule unused part of report, obtain employee's signature, make notation of transfer, sign report, and forward original to Supervisor's office and duplicate to new timekeeper.

Paid in cash by S. D. F. A. ____

Date ____ Check No. ____ $____

ORIGINAL

GOVERNMENT PRINTING OFFICE 8—5318